SMET Temperature/Humidity Field Calibration (CALF)

I. Purpose:

The purpose of this procedure is to describe the steps performed by the RESET team to field-calibrate the SMET temperature/humidity probe. **Note: the humidity calibration using standard salts is not normally performed during routine RESET visits.**

II. Cautions and Hazards:

- Because the humidity calibration involves the use of three salts, the RESET team should be aware of the information contained in the MSDS sheets describing their properties.

III. Requirements:

- Reference temperature/humidity probe with LCD readout.
- Temperature/humidity calibration box with two jars and a thermometer.
- If the calibration is performed outside in direct sun, an insulated box such as a small Styrofoam cooler is required and enough time must be allowed for the temperature to stabilize.

IV. Procedure:

A. Steps:

1. Compare temperature and humidity from the reference probe with temperature and humidity from the tower sensors.
2. If the temperatures agree within 2° C and the humidity is within +/- 4%, then log differences and stop.
3. Otherwise, remove sensors from the tower.
4. Place both the sensors from the tower and the reference in the calibration box.
5. For temperature calibration:
    a) Remove filter and place in calibration box.
    b) After 10 minutes compare both the temperature probe and reference with thermometer.
    c) If differences are less than 0.5° C, log differences and stop.
    d) Otherwise, call mentor to consider instrument replacement or recalibration.

e) If recalibrate, see PRO(DAQS)-004. for procedure using water bath.

6. For humidity calibration:

a) Prepare three salt solutions by putting salt in jars up to lower part of dark line on jar and filling to upper level with distilled water (allow 24 hours to equilabrate).

b) Remove filters and put probe and reference into holes in jar tops (do not put probes in the liquid).

c) Record humidities after 30 minutes (see PRO(TRH)-003. for procedure, using the Vaisala HMK11 Humidity Calibrator).

d) If differences agree to within 5% of three-point humidities (RH 11.3% for lithium chloride, 75.5% for NaCl, and 97.6% for K2SO4 at 20° C) then record differences and stop.

e) Contact mentor to consider recalibration or replacement.

f) If recalibrate adjust pot in probe to correct humidities with theoretical values.

g) If replace, repeat above with replacement probe.

V. References:

1. Hart, R.: "Element Operations and Maintenance Procedure Development Outline," Argonne National Laboratory," 1995.

VI. Attachments:

None.